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COMPLETE SPECIFICATION

Threaded Fastener

We, FORD MOTOR COMPANY LIMITED, a British company of 88 Regent Street, London, W.1., do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a threaded fastener and to an assembly secured by means of the fastener.

In assemblies using conventional threaded fasteners to fasten members transmitting varying shear forces thereto, only the friction between the head and nut of the threaded fastener and the sides of the fastened members resists the shear forces. Varying shear forces soon overcome the friction and elongation of the hole cross-section results. In the past, this has been prevented by using larger bolts with higher clamp forces and by carefully controlling hole tolerances.

The fastened assembly provided by this invention has a positive mechanical interference between the members and the fastener that resists the shear forces physically. An increased resistance to initial slipping of the members is thereby provided. Both decreased clamp forces and wider hole tolerances are permitted with the assembly and the assembly remains low in cost and easy to manufacture and assemble. In addition, the fastener can be reduced by a full size while maintaining the same load characteristics.

Accordingly, the invention provides a threaded fastener comprising a head and a shank, said shank having a first finned portion located adjacent the head and having an outside diameter smaller than that of the head, a second finned portion located adjacent the first finned portion and having an outside diameter smaller than the outside diameter of the first finned portion, and a screw threaded portion located adjacent the second finned portion and having a major diameter smaller than the outside diameter of the second finned portion.

It also provides an assembly secured by means of the fastener, in which a first member is located adjacent the head, the first member having a hole therein smaller than the first finned portion but larger than the second finned portion, the first finned portion being located in the hole in the first member,

a second member having a hole therein smaller than the second finned portion but larger than the major diameter of the screw threads, the second finned portion being located in the hole in the second member, and

a threaded nut threadably engaging the screw threads.

Either the fins of the finned portions or the material surrounding the holes in the fastened members or both deforms during assembly to provide a positive mechanical lift between the fastener and the members. Shear forces transmitted through the fastened members thus are resisted positively and the required clamping forces are reduced thereby permitting the use of smaller fasteners.

The accompanying drawing is a sectional view of an assembly fastened by the fastener of this invention.

Referring to the drawing, a first member 10 having a hole 12 therein is located against a second member 14 having a hole 16 therein. Hole 12 has a larger diameter than hole 16, and the holes are in substantial alignment with each other.

A threaded fastener indicated generally by the numeral 18 has a hexagon-shaped head 20 connected to a cylindrical body 22. Body 22 has a first finned portion 24 located adjacent head 20 and a second finned portion 26 located adjacent the first finned portion 24. Conventional screw threads 28 are formed on body 22 beginning adjacent second finned portion 26 and running out to the end of body 22.

The fins on both finned portions 24 and 26 are V-shaped with substantially sharp crests 24v and 26v at the outside diameter and pointed valleys 24c and 26c between them. All fins

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